

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/GB2004/003504

International filing date (day/month/year)  
13.08.2004

Priority date (day/month/year)  
14.08.2003

International Patent Classification (IPC) or both national classification and IPC  
B01J13/02, B01J13/16, B01J27/185

Applicant  
AVECIA LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3 For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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10/568146

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/GB2004/003504

1AP20 Rec'd PCT/PTO 13 FEB 2006

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. II Priority**

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1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
- ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
4. Additional observations, if necessary:

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**Box No. IV Lack of unity of invention**

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1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:

- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

- ☐ complied with
- ☒ not complied with for the following reasons:  
**see separate sheet**

4. Consequently, this report has been established in respect of the following parts of the international application:

- ☒ all parts.
- ☐ the parts relating to claims Nos.

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	17,18
	No: Claims	1-16,19-33
Inventive step (IS)	Yes: Claims	
	No: Claims	1-33
Industrial applicability (IA)	Yes: Claims	1-33
	No: Claims	

2. Citations and explanations

**see separate sheet**

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**Box No. VI Certain documents cited**

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1. Certain published documents (Rules 43bis.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43bis.1 and 70.9)

**see form 210**

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)

International application No.

PCT/GB2004/003504

1AP20 Rec'd PCT/FTO 13 FEB 2006

Re Item IV.  
Lack of unity

The present application lacks unity, the reason for the objection being the following:

The only common feature shared by the catalyst-ligand systems of claims 1, 15 and 17 is the microencapsulation of a catalyst and/or a ligand.

Catalyst-ligand systems containing this feature, namely a catalyst and a ligand encapsulated within a polymeric shell, are already known in the prior art, e.g. from WO 03/006151 (D1) - see claims 6-8 where e.g. metal phosphine or metal carbene compounds are disclosed, the metal being preferably a transition metal. The transition metals being known as such as being powerful catalysts and the phosphines or carbenes being known as being ligands, the transition metal phosphine or the transition metal carbene compounds are considered by the Examining Authority as being a catalyst-ligand system.

Hence, the problem supposed to be solved by the additional feature of the above identified inventions being to provide alternative microencapsulated catalyst-ligand systems, there is no special technical feature, in other words no technical contribution over D1 in the sense of Rule 13.2 PCT linking together the above three inventions.

Thus, the separate inventions are the following:

I. Claims 1-14 and dependent claims when dependent on claims 1-14

A microencapsulated catalyst-ligand system comprising a catalyst and a ligand microencapsulated within a permeable polymer microcapsule shell.

II. Claims 15,16 and dependent claims when dependent on claims 15,16

A microencapsulated catalyst-ligand system comprising a catalyst microencapsulated within a permeable polymer microcapsule shell, the shell being further treated with a ligand.

III. Claims 17,18 and dependent claims when dependent on claims 17,18

A microencapsulated catalyst-ligand system comprising ligand microencapsulated within a permeable polymer microcapsule shell, the shell being further treated with a catalyst.

**Re Item V.**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. The following documents are referred to in this communication:

D1 : WO-A-03/006151

D2 : EP-A-0 940 170

D3 : WO-A-02/070131 & D3A: EP-A-1 386 663

D4 : US-A-2002/045709

2. Although claims 1,2,3; 13,14 (of invention I); 15,16 (of invention II); and 17,18 (of invention III) have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter.

The aforementioned claims therefore lack conciseness.

Hence, the claims do not meet the requirements of Article 6 PCT and therefore an objective and detailed examination of novelty and inventive step cannot be carried out at this stage for all the claims of the three inventions.

This opinion is therefore restricted to the first independent claim in each category of each invention and their dependent claims.

3. There is insufficient disclosure in the description for inventions II and III, since it is not clear from the examples how the ligand, respectively the metal catalyst is introduced in the microcapsule containing the catalyst, respectively the ligand.

#### 4. Invention I

a) The definition of the microcapsule shell in claim 1 as a 'permeable' polymer is not to be considered as a technical feature since it is not clear for what is 'permeable' said

polymer.

b) **D1** discloses catalyst systems comprising a microencapsulated e.g. metal phosphine or metal carbene compounds, the metal being preferably a transition metal (see page 6, line 27 - page 7, line 6; page 7, line 21 - page 8, line 20; page 8, line 30 - page 9, line 37; claims 6-8). The transition metals being known as such as being powerful catalysts and the phosphines or carbenes being known as being ligands, the transition metal phosphine or the transition metal carbene compounds are considered as being a catalyst-ligand system.

Therefore the disclosure of **D1** appear to totally anticipate in terms of novelty the subject-matter of all the claims of the first invention (Article 33(1) and (2) PCT).

c) **D2** discloses catalyst systems comprising an osmium oxide-chiral ligand complex microencapsulated in a polyolefin (see page 3, line 1-4; page 4, lines 32-43 and 52-55; claims 1,5,12) which affect the novelty of claims 1,7,8,10.

d) The subject-matter of present claims 1, 7-12 is anticipated by the disclosure of **D3A** (the EP-version of **D3** - document in Japanese, published in time) which discloses microencapsulated metal catalyst, wherein the metal catalyst is, e.g. a triphenylphosphine metal catalyst (see page 2, lines 30-44; page 3, lines 23-47; example 1).

## 5. Invention II

a) **D1** disclosed an addition reaction (see example 26) catalysed by a mixture of microencapsulated Pd-acetate and a ligand ( $\text{PPh}_3$ ) in an organic solvent which anticipate the subject-matter of claims 15,16,28-33.

b) **D2** discloses the preparation of a catalyst system by mixing microencapsulated osmium oxide and a chiral ligand (see page 4, lines 18-22; page 10, lines 1-12; example 3; claim 17) which anticipate the subject-matter of claims 15,28,29,31.

c) The subject-matter of present claims 15,28-33 is anticipated by the disclosure of **D3A** which discloses the better catalyst properties of a mixture of a microencapsulated metal catalyst and an external ligand (see page 4, lines 19-25; page 5, lines 27-57; example

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4).

**6. Invention III**

**D4** discloses a microencapsulated catalyst containing an imidazole compound or an organophosphorus compound as curing accelerator in liquid resin compositions.

The subject-matter of invention III meets the requirements of Article 33(1) and (2) PCT since none of the available prior art documents discloses a microencapsulated ligand within a permeable polymer microcapsule shell and the further treatment of the shell with a catalyst.

In view of **D1**, which is considered as the closest prior art, the technical problem addressed by the third invention can be regarded as the provision of an alternative microencapsulated catalyst-ligand system.

Since there are no unexpected advantage or benefits apparent from the application documents which could be associated with the new microencapsulated system, the subject-matter of the third invention does not meet the requirements of Article 33(3) PCT.

**Re Item VI.**

Certain published documents (Rule 70.10)

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
Anonymous//WWW.AVE CIA.COM/PHARMS/CO RETECH/TECHNOLOGI ES/PDENCAT_FLYER_ 020504.PDF = D5	05.2004		

Document D5 may constitute prior art in the national/regional phase of the present international application.